Amendments to the Claims:

This listing of the claims will replace all prior versions, and listings of claims in the application.

Listings of Claims:

1. (Currently Amended) A plasma processing apparatus comprising:

a plasma processing chamber having a plasma excitation electrode for exciting a plasma;

a radiofrequency generator for supplying a radiofrequency voltage to the electrode;

a radiofrequency feeder connected to the electrode; and

a matching circuit having an input terminal and an output end, wherein the input terminal is connected to the radiofrequency generator and the output end is connected to an end of the radiofrequency feeder so as to achieve impedance matching between the plasma processing chamber and the radiofrequency generator,

wherein a frequency which is three times a first series resonant frequency f_0 of the plasma processing chamber which is measured at the end of the radiofrequency feeder is larger than a power frequency f_e of the radiofrequency waves, and

wherein the first series resonant frequency f_0 corresponds to a minimum impedance of the plasma processing chamber, the minimum impedance evaluated with the plasma chamber disconnected from the plasma apparatus during a non-discharge period.

2. (Original) A plasma processing apparatus according to claim 1, wherein a frequency of 1.3 times the first series resonant frequency f_0 is larger than a power frequency f_e.

3. (Original) A plasma processing apparatus according to claim 2, wherein the first series resonant frequency f_0 is larger than three times the power frequency f_e.

4. (Original) A plasma processing apparatus according to claim 3, wherein a series resonant frequency f_0' which is defined by a capacitance between the plasma excitation electrode and a counter electrode for generating the plasma in cooperation with the plasma excitation electrode is larger than three times the power frequency f_e.

5. (Original) A plasma processing apparatus according to claim 4, wherein the plasma excitation electrode and the counter electrode are of a parallel plate type, and the series resonant frequency f_0' and the power frequency f_e satisfy the relationship:

$$f_0' > \sqrt{\frac{d}{\delta}}\, f_e$$

wherein d represents the distance between the plasma excitation electrode and the counter electrode, and δ represents the sum of the distance between the plasma excitation electrode and the generated plasma and the distance between the counter electrode and the generated plasma.

6. (Original) A plasma processing apparatus according to claim 1, further comprising a resonant frequency measuring terminal for measuring the resonant frequency of the plasma processing chamber, in the vicinity of the end of the radiofrequency feeder.

7. (Original) A plasma processing apparatus according to claim 6, further comprising a switch provided between the radiofrequency feeder and the resonant frequency measuring terminal, wherein the switch electrically disconnects the end of the radiofrequency feeder from the resonant frequency measuring terminal and connects the end of the radiofrequency feeder to the output end of the matching circuit in a plasma excitation mode in which the plasma is excited, whereas the switch electrically connects the end of the radiofrequency feeder to the resonant frequency measuring terminal and disconnects the end of the radiofrequency feeder from the resonant

frequency measuring terminal in a measuring mode in which the resonant frequency of the plasma processing chamber is measured.

8. (Original) A plasma processing apparatus according to claim 6, further comprising a resonant frequency measuring unit which is detachably connected to the resonant frequency measuring terminal.

9. (Currently Amended) A plasma processing apparatus according to claim 8, wherein characteristics of the resonant frequency ~~characteristics~~ in the plasma excitation mode and characteristics of the resonant frequency ~~characteristics~~ in the measuring mode are set to be equal to each other.

10 – 62 (Cancelled).

63. (New) A plasma processing apparatus comprising:

a plasma processing chamber having a plasma excitation electrode for exciting a plasma, a counter electrode, and a shower plate disposed between the plasma excitation electrode and the counter electrode;

a radiofrequency generator for supplying a radiofrequency voltage to the electrode;

a radiofrequency feeder connected to the electrode; and

a matching circuit having an input terminal and an output end, wherein the input terminal is connected to the radiofrequency generator and the output end is connected to an end of the radiofrequency feeder so as to achieve impedance matching between the plasma processing chamber and the radiofrequency generator,

wherein a frequency which is three times a first series resonant frequency f_0 of the plasma processing chamber which is measured at the end of the radiofrequency feeder is larger than a power frequency f_e of the radiofrequency waves, and

wherein the first series resonant frequency f_0 corresponds to a minimum impedance of the plasma processing chamber, the minimum impedance evaluated with

the plasma chamber disconnected from the plasma apparatus during a non-discharge period.